

EAST SEARC 09/658,214

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	14	semi adj regul\$6 same mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 07:59
L2	12	semi adj regul\$6 same mesh\$4 and vertex	US-PGPU B, USPAT	OR	ON	2005/08/22 07:59
L3	6	semi adj regul\$6 same mesh\$4 and vertex and mov\$6	US-PGPU B, USPAT	OR	ON	2005/08/22 08:00
L4	3	semi adj regul\$6 same mesh\$4 and vertex and mov\$6 same mesh\$5 same point	US-PGPU B, USPAT	OR	ON	2005/08/22 08:00
L5	6	semi adj regul\$6 same mesh\$4 and vertex and mov\$6 and point\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:01
L6	69	"345"/\$.ccls. and wavelet and compres\$5 and mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:01
L7	20585	compres\$4 same mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:01
L8	211	"345"/\$.ccls. and compres\$4 same mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:01
L9	144	"345"/419,420,421,422,423, 424,426,427,428.ccls. and compres\$4 same mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:02
L10	45	"345"/419,420,421,422,423, 424,426,427,428.ccls. and compres\$4 near2 mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:02
L11	22	"382"/\$.ccls. and compres\$4 near2 mesh\$4	US-PGPU B, USPAT	OR	ON	2005/08/22 08:02
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L13	22	(wavelet and transform and replac\$4 and mesh and coarser and sequenc\$4 and coefficient and compres\$4)	US-PGPU B, USPAT	OR	ON	2005/08/22 08:03
L14	36	(wavelet and transform and replac\$4 and mesh and coars\$8 and sequenc\$4 and coefficient and compres\$7)	US-PGPU B, USPAT	OR	ON	2005/08/22 08:03

L15	33	semi adj regul\$6 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:04
L16	28	semi adj regul\$6 and coars\$6	US-PGPU B; USPAT	OR	ON	2005/08/22 08:04
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L22	6	semi adj regul\$6 same mesh\$4 and vertex and mov\$6 and point\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:07
L23	400	wavelet and compres\$5 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:07
L24	111	"382"/\$.ccls. and wavelet and compres\$5 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:07
L25	3	"715"/\$.ccls. and wavelet and compres\$5 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:07
L26	69	"345"/\$.ccls. and wavelet and compres\$5 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:08
L27	45	345/419,420,423,424,426, 427,428,555,581,473.ccls. and wavelet and compres\$5 and mesh\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:08
L28	22	345/419,420,423,424,426, 427,428,555,581,473.ccls. and wavelet and compres\$5 and mesh\$4 and coars\$6	US-PGPU B; USPAT	OR	ON	2005/08/22 08:08
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L31	9	(uneven or un-even) and paramet\$6 and (displace\$5 same tangent\$5 same plane) and (surface same geometr\$6)	US-PGPU B; USPAT	OR	ON	2005/08/22 08:09
L32	132	three adj dimension\$5 same part and paramet\$6 and displac\$4 and tangent and surface and normal	US-PGPU B; USPAT	OR	ON	2005/08/22 08:10
L33	68	three adj dimension\$5 same part and paramet\$6 and displac\$4 and tangent and surface and normal and compres\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:10
L34	8	"345"/\$.ccls. and three adj dimension\$5 same part and paramet\$6 and displac\$4 and tangent and surface and normal and compres\$4	US-PGPU B; USPAT	OR	ON	2005/08/22 08:10
L35	3	(three adj dimension\$5 same part) and paramet\$6 and (displac\$4 same normal) and compres\$4 and tangent and surface	US-PGPU B; USPAT	OR	ON	2005/08/22 08:11

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	1052	compres\$5 and (tangent\$6 adj plane)	US-PGPU B; USPAT	OR	ON	2005/08/22 08:49
L7	67	compres\$5 and ((tangent\$6 adj plane) same displac\$6)	US-PGPU B; USPAT	OR	ON	2005/08/22 08:50
L8	3	"345"/\$.ccls. and compres\$5 and ((tangent\$6 adj plane) same displac\$6)	US-PGPU B; USPAT	OR	ON	2005/08/22 08:51
L9	3	"382"/\$.ccls. and compres\$5 and ((tangent\$6 adj plane) same displac\$6)	US-PGPU B; USPAT	OR	ON	2005/08/22 08:50

Interference Search 09/658,214

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	((compres\$5 same surfac\$4) and (form\$4 same (semi adj regular) same mesh\$4) and geometr\$5 and vertex same mov\$5).clm.	US-PGPU B; USPAT	OR	ON	2005/08/22 08:18
L2	0	(compres\$5 and surfac\$4 and form\$4 and (semi adj regular) same mesh\$4 and geometr\$5 and vertex and mov\$5).clm.	US-PGPU B; USPAT	OR	ON	2005/08/22 08:20
L3	0	(compres\$5 and surfac\$4 and form\$4 and (semi adj regular) and mesh\$4 and geometr\$5 and vertex and mov\$5).clm	US-PGPU B; USPAT	OR	ON	2005/08/22 08:21
L4	0	(compres\$5 and surfac\$4 and form\$4 and (semi adj regular) and mesh\$4 and geometr\$5 and vertex).clm.	US-PGPU B; USPAT	OR	ON	2005/08/22 08:21
L5	0	(compres\$5 and surfac\$4 and form\$4 and (semi-regular) and mesh\$4 and geometr\$5 and vertex).clm.	US-PGPU B; USPAT	OR	ON	2005/08/22 08:21

Day : Monday
Date: 8/22/2005

Time: 08:25:36

 **PALM INTRANET**

Inventor Information for 09/658214

Inventor Name	City	State/Country
SCHROEDER, PETER	PASADENA	CALIFORNIA

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Time: 08:25:44

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Inventor Name Search Result

Your Search was:

Last Name = SCHROEDER

First Name = PETER

Application#	Patent#	Status	Date Filed	Title	Inventor Name
60665481	Not Issued	020	03/25/2005	METHODS AND SEQUENCES TO SUPPRESS PRO-INFLAMMATORY CYTOKINE ACTIONS LOCALLY TO TREAT PAIN	SCHROEDER, PETER
60551289	Not Issued	159	03/08/2004	METHODS FOR USING POLYOL ESTERS TO CONTROL PESTS	SCHROEDER, PETER J.
60323691	Not Issued	159	09/20/2001	NEAR-OPTIMAL CONNECTIVITY ENCODING OF 2-MANIFOLD POLYGON MESHES	SCHROEDER, PETER
60269016	Not Issued	159	02/15/2001	CONSISTENT MESH PARAMETERIZATIONS	SCHROEDER, PETER
60265433	Not Issued	159	01/30/2001	HYBRID MESHES	SCHROEDER, PETER
60221272	Not Issued	159	07/26/2000	USE OF NORMAL MESHES IN THREE-DIMENSIONAL IMAGING	SCHROEDER, PETER
60181381	Not Issued	159	02/09/2000	INTERACTIVE ANIMATION OF STRUCTURED DEFORMABLE OBJECTS	SCHROEDER, PETER
60178134	Not Issued	159	01/26/2000	PROGRESSIVE GEOMETRY COMPRESSION	SCHROEDER, PETER
60176369	Not Issued	159	01/14/2000	NORMAL MESHES	SCHROEDER, PETER
60176155	Not Issued	159	01/14/2000	PROGRESSIVE GEOMETRY COMPRESSION	SCHROEDER, PETER
29188400	Not Issued	030	08/18/2003	FLUID CANISTER	SCHROEDER, PETER
11071032	Not Issued	020	03/03/2005	METHODS FOR USING POLYOL ESTERS TO CONTROL PESTS	SCHROEDER, PETER J.

10260659	Not Issued	041	09/30/2002	METHOD FOR APPLYING A DRUG COATING TO A MEDICAL DEVICE	SCHROEDER, PETER T.
10252019	Not Issued	060	09/19/2002	CONNECTIVITY ENCODING AND DECODING OF POLYGON MESHES	SCHROEDER, PETER
10075793	6831638	150	02/14/2002	METHOD AND APPARATUS FOR GENERATION OF CONSISTENT PARAMETERIZATIONS FOR A SET OF MESHES	SCHROEDER, PETER
09998536	Not Issued	041	11/28/2001	MEDICAL ELECTRICAL LEADS AND INDWELLING CATHETERS WITH ENHANCED BIOCOMPATIBILITY AND BIOSTABILITY	SCHROEDER, PETER T.
09833268	Not Issued	041	04/11/2001	OBJECT SURFACE REPRESENTATION AND RELATED METHODS AND SYSTEMS	SCHROEDER, PETER
09833267	6603473	150	04/11/2001	DETAIL DATA PERTAINING TO THE SHAPE OF AN OBJECT SURFACE AND RELATED METHODS AND SYSTEMS	SCHROEDER, PETER
09833266	6920415	150	04/11/2001	METHOD OF TRIMMING A REPRESENTATION OF AN OBJECT SURFACE COMPRISING A MESH OF TESSELLATED POLYGONS AND RELATED SYSTEM	SCHROEDER, PETER
09820383	Not Issued	071	07/26/2000	USE OF NORMAL MESHES IN THREE-DIMENSIONAL IMAGING	SCHROEDER, PETER
09658214	Not Issued	071	09/08/2000	COMPRESSION OF 3D SURFACES USING PROGRESSIVE GEOMETRY	SCHROEDER, PETER
09569352	6573897	150	05/11/2000	REAL-TIME, INTERACTIVE ANIMATION OF DEFORMABLE TWO-AND THREE-DIMENSIONAL OBJECTS	SCHROEDER, PETER
09508510	6923956	150	05/26/2000	LIQUID INTERFERON-BETA FORMULATIONS	SCHROEDER, PETER
09496137	Not	061	02/01/2000	THREE DIMENSIONAL	SCHROEDER,

	Issued			SURFACE DRAWING CONTROLLED BY HAND MOTION	PETER
09491353	6876956	150	01/26/2000	METHOD AND SYSTEM FOR THIN-SHELL FINITE- ELEMENT ANALYSIS	SCHROEDER, PETER
09358341	Not Issued	168	07/21/1999	MEDICAL ELECTRICAL LEADS AND INDWELLING CATHETERS WITH ENHANCED BIOCOMPATIBILITY AND BIOSTABILITY	SCHROEDER, PETER T.
09063227	Not Issued	041	04/20/1998	MEDICAL ELECTRICAL LEADS AND INDWELLING CATHETERS WITH ENHANCED BIOCOMPATIBILITY AND BIOSTABILITY	SCHROEDER, PETER T.
08848044	5928634	150	04/28/1997	LIQUID INSECT BAIT	SCHROEDER, PETER J.
08717453	5912220	150	09/20/1996	SURFACTANT COMPLEX WITH ASSOCIATIVE POLYMERIC THICKENER	SCHROEDER, PETER J.
08370046	Not Issued	166	01/09/1995	LIQUID INSECT BAIT	SCHROEDER, PETER J
08307595	5554577	150	10/13/1994	AGENTS FOR THE STIMULATION AND CULTIVATION OF PLANT GROWTH AND PROCESS FOR PRODUCING SAID AGENTS	SCHROEDER, PETER
08178770	Not Issued	161	01/07/1994	DEVICE FOR CONTROLLING ROTATIONAL ORIENTATION OF A SUSPENDED BODY	SCHROEDER, PETER
06945923	4888325	250	12/23/1986	CONTROLLING PLANT PESTS WITH COMPOSITIONS CONTAINING ALKYL GLYCOSIDE	SCHROEDER, PETER
06878886	4820517	150	07/24/1986	PROCESS FOR OBTAINING A PEPPER EXTRACT WITH INSECTICIDAL ACTIVITY	SCHROEDER, PETER
06847795	4725712	150	04/03/1986	ELECTRICAL DEVICE FOR VAPORIZING VOLATILES	SCHROEDER, PETER
06778231	4687244	150	09/20/1985	LIFT AND REORIENTING MECHANISM	SCHROEDER, PETER J.
06747246	4726359	150	06/21/1985	PROTECTIVE END CAPS ON ROLLED CONDOMS	SCHROEDER, PETER

06745755	D294852	150	06/17/1985	ELECTRICAL APPARATUS FOR VAPORIZING INSECTICIDE TABLETS	SCHROEDER, PETER
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 Terms used **semi regular** and **mesh**

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1 [Semi-regular mesh extraction from volumes](#)

Zoë J. Wood, Peter Schröder, David Breen, Mathieu Desbrun

 October 2000 **Proceedings of the conference on Visualization '00**

 Full text available: [pdf \(4.93 MB\)](#)

 Additional Information: [full citation](#), [citations](#), [index terms](#)

Keywords: implicit functions, level set methods, semi-regular meshes, subdivision, surface extraction, volumes

2 [Curves and Surfaces: Hierarchical extraction of iso-surfaces with semi-regular meshes](#)

Kai Hormann, Ulf Labsik, Martin Meister, Gunther Greiner

 June 2002 **Proceedings of the seventh ACM symposium on Solid modeling and applications**

 Full text available: [pdf \(844.44 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper we present a novel approach to iso-surface extraction which is based on a multiresolution volume data representation and hierarchically approximates the iso-surface with a semi-regular mesh. After having generated a hierarchy of volumes, we extract the iso-surface from the coarsest resolution with a standard Marching Cubes algorithm, apply a simple mesh decimation strategy to improve the shape of the triangles, and use the result as a base mesh. Then we iteratively fit the mesh to ...

Keywords: geometric and topologic representations, multi resolution models, reverse engineering

3 [Hybrid meshes: multiresolution using regular and irregular refinement](#)

Igor Guskov, Andrei Khodakovsky, Peter Schröder, Wim Sweldens

 June 2002 **Proceedings of the eighteenth annual symposium on Computational geometry**

 Full text available: [pdf \(21.21 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A hybrid mesh is a multiresolution surface representation that combines advantages from regular and irregular meshes. Irregular operations allow a hybrid mesh to change topology throughout the hierarchy and approximate detailed features at multiple scales. A


preponderance of regular refinements allows for efficient data-structures and processing algorithms. We provide a user driven procedure for creating a hybrid mesh from scanned geometry and present a progressive hybrid mesh compression algorithm ...

Keywords: compression algorithms, curves & surfaces, geometric modeling, level of detail algorithms, polygonal modeling, remeshing

4 Normal meshes

Igor Guskov, Kiril Vidimčević, Wim Sweldens, Peter Schröder

July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(6.96 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Normal meshes are new fundamental surface descriptions inspired by differential geometry. A normal mesh is a multiresolution mesh where each level can be written as a normal offset from a coarser version. Hence the mesh can be stored with a single float per vertex. We present an algorithm to approximate any surface arbitrarily closely with a normal semi-regular mesh. Normal meshes can be useful in numerous applications such as compression, filtering, rendering, texturing, and modeling.

Keywords: irregular connectivity, meshes, multiresolution, subdivision, surface parameterization, wavelets

5 Variational normal meshes

Ilja Friedel, Peter Schröder, Andrei Khodakovsky

October 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 4

Full text available:  pdf(188.22 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Hierarchical representations of surfaces have many advantages for digital geometry processing applications. Normal meshes are particularly attractive since their level-to-level displacements are in the local normal direction only. Consequently, they only require scalar coefficients to specify. In this article, we propose a novel method to approximate a given mesh with a normal mesh. Instead of building an associated parameterization on the fly, we assume a globally smooth parameterization ...

Keywords: (semi-)regular meshes, Hierarchy, normal meshes, resampling, subdivision, surface approximation

6 Multiresolution signal processing for meshes

Igor Guskov, Wim Sweldens, Peter Schröder

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(10.67 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Laplacian pyramid, irregular connectivity, meshes, multiresolution, subdivision, surface parameterization, wavelets

7 Consistent mesh parameterizations

Emil Praun, Wim Sweldens, Peter Schröder


August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(2.97 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A basic element of Digital Geometry Processing algorithms is the establishment of a smooth parameterization for a given model. In this paper we propose an algorithm which establishes parameterizations for a set of models. The parameterizations are called consistent because they share the same base domain and respect features. They give immediate correspondences between models and allow remeshes with the same connectivity. Such remeshes form the basis for a large class of algorithms, including ...

8 [Progressive geometry compression](#)

Andrei Khodakovsky, Peter Schröder, Wim Sweldens



July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**Full text available:  [pdf\(7.41 MB\)](#)Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We propose a new progressive compression scheme for arbitrary topology, highly detailed and densely sampled meshes arising from geometry scanning. We observe that meshes consist of three distinct components: geometry, parameter, and connectivity information. The latter two do not contribute to the reduction of error in a compression setting. Using semi-regular meshes, parameter and connectivity information can be virtually eliminated. Coupled with semi-regular wavelet transforms, zerotree c ...

Keywords: compression algorithms, hierarchical representations, semi-regular meshes, signal processing, subdivision surfaces, wavelets, zerotree coding

9 [Mesh parameterization: Inter-surface mapping](#)

John Schreiner, Arul Asirvatham, Emil Praun, Hugues Hoppe

August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3Full text available:  [pdf\(764.24 KB\)](#)
 [mov\(22:12 MIN\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We consider the problem of creating a map between two arbitrary triangle meshes. Whereas previous approaches compose parametrizations over a simpler intermediate domain, we directly create and optimize a continuous map between the meshes. Map distortion is measured with a new symmetric metric, and is minimized during interleaved coarse-to-fine refinement of both meshes. By explicitly favoring low inter-surface distortion, we obtain maps that naturally align corresponding shape elements. Typical ...

Keywords: remeshing, shape morphing, surface parametrization

10 [Session 2: Geometry compression of normal meshes using rate-distortion algorithms](#)

Sridhar Lavu, Hyeokho Choi, Richard Baraniuk

June 2003 **Proceedings of the 2003 Eurographics/ACM SIGGRAPH symposium on Geometry processing SGP '03**Full text available:  [pdf\(285.71 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We propose a new rate-distortion based algorithm for compressing 3D surface geometry represented using triangular *normal meshes*. We apply the Estimation-Quantization (EQ) algorithm to compress normal mesh wavelet coefficients. The EQ algorithm models the wavelet coefficients as a Gaussian random field with slowly varying standard deviation that depends on the local neighborhood and uses rate-distortion optimal scalar quantizers. We achieve gains of 0.5 to 1 dB with the EQ algorithm compar ...

11 Non-iterative feature-preserving mesh smoothing

Thouis R. Jones, Frédo Durand, Mathieu Desbrun


July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3Full text available:  [pdf\(8.01 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

With the increasing use of geometry scanners to create 3D models, there is a rising need for fast and robust mesh smoothing to remove inevitable noise in the measurements. While most previous work has favored diffusion-based iterative techniques for feature-preserving smoothing, we propose a radically different approach, based on robust statistics and local first-order predictors of the surface. The robustness of our local estimates allows us to derive a *non-iterative* feature-preserving f ...

Keywords: anisotropic diffusion, bilateral filtering, mesh fairing, mesh processing, mesh smoothing, robust estimation

12 Deformations & shaping: Free-form skeleton-driven mesh deformations

Shin Yoshizawa, Alexander G. Belyaev, Hans-Peter Seidel



June 2003 **Proceedings of the eighth ACM symposium on Solid modeling and applications**Full text available:  [pdf\(464.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we propose a new scheme for free-form skeleton-driven global mesh deformations. First a Voronoi-based skeletal mesh is extracted from a given original mesh. Next the skeletal mesh is modified by free-form deformations. Then a desired global shape deformation is obtained by reconstructing the shape corresponding to the deformed skeletal mesh. We develop a mesh fairing procedure allowing us to avoid possible global and local self-intersections of the reconstructed mesh. Finally, use ...

Keywords: Voronoi-based skeletal mesh, free-form global shape deformations

13 Session P10: multiresolution and compression: Fast extraction of adaptive multiresolution meshes with guaranteed properties from volumetric data


Marcel Gavrilu, Joel Carranza, David E. Breen, Alan H. Barr

October 2001 **Proceedings of the conference on Visualization '01**Full text available:  [pdf\(8.02 MB\)](#)  [Publisher Site](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a new algorithm for extracting adaptive multiresolution triangle meshes from volume datasets. The algorithm guarantees that the topological genus of the generated mesh is the same as the genus of the surface embedded in the volume dataset at all levels of detail. In addition to this "hard constraint" on the genus of the mesh, the user can choose to specify some number of soft geometric constraints, such as triangle aspect ratio, minimum or maximum total number of vertices, minimum and ...

14 Meshes: Consistent parametrization by quinary subdivision for remeshing and mesh metamorphosis

Jian Liang Lin, Jung Hong Chuang, Cheng Chung Lin, Chih Chun Chen

February 2003 **Proceedings of the 1st international conference on Computer graphics and interactive techniques in Australasia and South East Asia**Full text available:  [pdf\(16.30 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The vertex correspondence establishment among multiple objects is a versatile operation in

computer graphics and geometry processing. We propose a systematic method called *recursive quinary subdivision* to efficiently find a dissection for a meshed object of genus-zero with little user input. The process can be easily extended to multiple objects, taking into account the alignment of extra feature points for applications such as mesh metamorphosis, to derive a common dissection. Based on t ...

Keywords: mesh dissection, metamorphosis, multiresolution modeling, parameterization, remeshing

15 Session 5: Multi-chart geometry images

P. V. Sander, Z. J. Wood, S. J. Gortler, J. Snyder, H. Hoppe

June 2003 **Proceedings of the 2003 Eurographics/ACM SIGGRAPH symposium on Geometry processing SGP '03**

Full text available:  [pdf\(19.27 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We introduce multi-chart geometry images, a new representation for arbitrary surfaces. It is created by resampling a surface onto a regular 2D grid. Whereas the original scheme of Gu et al. maps the entire surface onto a single square, we use an atlas construction to map the surface piecewise onto charts of arbitrary shape. We demonstrate that this added flexibility reduces parametrization distortion and thus provides greater geometric fidelity, particularly for shapes with long extremities, high ...

16 Poster session: Adaptive and quality 3D meshing from imaging data

Yongjie Zhang, Chandrajit Bajaj, Bong-Soo Sohn

June 2003 **Proceedings of the eighth ACM symposium on Solid modeling and applications**

Full text available:  [pdf\(558.09 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


This paper presents an algorithm to extract adaptive and quality 3D meshes directly from volumetric imaging data - primarily Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). The extracted tetrahedral and hexahedral meshes are extensively used in finite element simulations. Our comprehensive approach combines bilateral and anisotropic (feature specific) diffusion filtering, with contour spectrum based, isosurface and interval volume selection. Next, a top-down octree subdivision cou ...

Keywords: 3D meshes, adaptive, feature sensitive, hanging nodes, quality

17 Session D: Geometry: View-dependent refinement of multiresolution meshes with subdivision connectivity

Daniel I. Azuma, Daniel N. Wood, Brian Curless, Tom Duchamp, David H. Salesin, Werner Stuetzle

February 2003 **Proceedings of the 2nd international conference on Computer graphics, virtual Reality, visualisation and interaction in Africa**

Full text available:  [pdf\(3.07 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a view-dependent level-of-detail algorithm for triangle meshes with subdivision connectivity. The algorithm is more suitable for textured meshes of arbitrary topology than existing progressive mesh-based schemes. It begins with a wavelet decomposition of the mesh, and, per frame, finds a partial sum of wavelets necessary for high-quality renderings from that frame's viewpoint. We present a screen-space error metric that measures both geometric and texture deviation and tends to outperform ...

Keywords: level-of-detail, multiresolution representations, view-dependent refinement, wavelets

18 Motion editing and compression: Wavelet compression of parametrically coherent mesh sequences

Igor Guskov, Andrei Khodakovsky

August 2004 **Proceedings of the 2004 ACM SIGGRAPH/Eurographics symposium on Computer animation**

Full text available:  [pdf\(2.36 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce an efficient compression method for animated sequences of irregular meshes of the same connectivity. Our approach is to transform the original input meshes with an anisotropic wavelet transform running on top of a progressive mesh hierarchy, and progressively encode the resulting wavelet details. For temporally coherent mesh sequences we get additional improvement by encoding the differences of the wavelet coefficients. The resulting compression scheme is scalable, efficient, and ...



19 Mesh parameterization: Painting detail

Nathan A. Carr, John C. Hart

August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3

Full text available:  [pdf\(25.68 MB\)](#)  [mov\(25:32 MIN\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Surface painting is a technique that allows a user to paint a texture directly onto a surface, usually with a texture atlas: a 1:1 mapping between the surface and its texture image. Many good automatic texture atlas generation methods exist that evenly distribute texture samples across a surface based on its area and/or curvature, and some are even sensitive to the frequency spectrum of the input texture. However, during the surface painting process, the texture can change non-uniformly and unpr ...




Keywords: 3D painting, Mesh parametrization, face clustering, texture atlas

20 Is this a quadrisected mesh?

Gabriel Taubin

May 2001 **Proceedings of the sixth ACM symposium on Solid modeling and applications**

Full text available:  [pdf\(758.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper we introduce a fast and efficient linear time and space algorithm to detect and reconstruct uniform Loop subdivision structure, or triangle quadrisection, in irregular triangular meshes. Instead of a naive sequential traversal algorithm, and motivated by the concept of *covering surface* in Algebraic Topology, we introduce a new algorithm based on global connectivity properties of the *covering mesh*. We consider two main applications for this algorithm. The first one ...



Keywords: 3D geometry compression, algorithms, graphics, subdivision surfaces

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Application#	Patent#	Status	Date Filed	Title	Inventor Name
60269016	Not Issued	159	02/15/2001	CONSISTENT MESH PARAMETERIZATIONS	SWELDENS, WIM
60265433	Not Issued	159	01/30/2001	HYBRID MESHES	SWELDENS, WIM
60188137	Not Issued	159	03/09/2000	METHOD OF WIRELESS COMMUNICATION USING UNITARY SPACE (MITIME SIGNAL CONSTELLATIONS)	SWELDENS, WIM
60158472	Not Issued	159	10/08/1999	RECEPTION METHOD FOR MULTIPLE-ANTENNA WIRELESS COMMUNICATION	SWELDENS, WIM
11006157	Not Issued	030	12/07/2004	METHOD AND APPARATUS FOR ENABLING AUTHORIZED AND BILLABLE MESSAGE TRANSMISSION BETWEEN MULTIPLE COMMUNICATIONS ENVIRONMENTS	SWELDENS, WIM
10977555	Not Issued	041	10/28/2004	HYBRID MESHES	SWELDENS, WIM
10748375	Not Issued	030	12/30/2003	"ROAMING" METHOD AND APPARATUS FOR USE IN EMULATING A USER'S "HOME" TELECOMMUNICATIONS ENVIRONMENT	SWELDENS, WIM
10075793	6831638	150	02/14/2002	METHOD AND APPARATUS FOR GENERATION OF CONSISTENT PARAMETERIZATIONS FOR A SET OF MESHES	SWELDENS, WIM
10066100	Not Issued	095	01/30/2002	HYBRID MESHES	SWELDENS, WIM
09820383	Not Issued	071	07/26/2000	USE OF NORMAL MESHES IN THREE-DIMENSIONAL	SWELDENS, WIM

				IMAGING	
09794865	6865587	150	02/27/2001	INTERPOLATING FILTER BANKS IN ARBITRARY DIMENSIONS	SWELDENS, WIM
09767640	Not Issued	161	01/23/2001	SYSTEM AND METHOD FOR DISTRIBUTING WEB CONTENT ON A NETWORK	SWELDENS, WIM
09643459	6801579	150	08/22/2000	METHOD OF WIRELESS COMMUNICATION USING UNITARY SPACE-TIME SIGNAL CONSTELLATIONS	SWELDENS, WIM
09588488	6449604	150	06/06/2000	METHOD FOR CHARACTERIZING AND VISUALIZING PATTERNS OF USAGE OF A WEB SITE BY NETWORK USERS	SWELDENS, WIM
09580751	6778615	150	05/30/2000	METHOD AND APPARATUS FOR BLOCK NONCOHERENT DECODING	SWELDENS, WIM
09504174	6724843	150	02/15/2000	METHOD AND APPARATUS FOR FAST DECODING IN A MULTIPLE-ANTENNA WIRELESS COMMUNICATION SYSTEM	SWELDENS, WIM
09395246	Not Issued	124	09/13/1999	NON-UNIFORM RELAXATION PROCEDURE FOR MULTIREOLUTION MESH PROCESSING	SWELDENS, WIM
09356387	6724842	150	07/16/1999	METHOD FOR WIRELESS DIFFERENTIAL COMMUNICATION USING MULTIPLE TRANSMITTER ANTENNAS	SWELDENS, WIM
09354232	Not Issued	161	07/16/1999	FILTER BANK DESIGN USING NILPOTENT MATRICES	SWELDENS, WIM
09253410	6249797	150	02/17/1999	INTERPOLATING FILTER BANKS IN ARBITRARY DIMENSIONS	SWELDENS, WIM
09206843	6363121	150	12/07/1998	WIRELESS TRANSMISSION METHOD FOR ANTENNA ARRAYS USING UNITARY SPACE-TIME SIGNALS	SWELDENS, WIM
09082792	6182097	150	05/21/1998	METHOD FOR CHARACTERIZING AND VISUALIZING PATTERNS OF USAGE OF A WEB SITE BY	SWELDENS, WIM

				NETWORK USERS	
09075303	6285372	150	05/08/1998	MULTIRESOLUTION ADAPTIVE PARAMETERIZATION OF SURFACES	SWELDENS, WIM
08902557	6018753	150	07/29/1997	INTERPOLATING FILTER BANKS IN ARBITRARY DIMENSIONS	SWELDENS, WIM
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Last Name = KHODAKOVSKY

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Application#	Patent#	Status	Date Filed	Title	Inventor Name
60323691	Not Issued	159	09/20/2001	NEAR-OPTIMAL CONNECTIVITY ENCODING OF 2-MANIFOLD POLYGON MESHES	KHODAKOVSKY, ANDREI
60265433	Not Issued	159	01/30/2001	HYBRID MESHES	KHODAKOVSKY, ANDREI
10977555	Not Issued	041	10/28/2004	HYBRID MESHES	KHODAKOVSKY, ANDREI
10252019	Not Issued	060	09/19/2002	CONNECTIVITY ENCODING AND DECODING OF POLYGON MESHES	KHODAKOVSKY, ANDREI
10066100	Not Issued	095	01/30/2002	HYBRID MESHES	KHODAKOVSKY, ANDREI

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